

IN THE CLAIMS

Claims 1-24 (canceled)

25. (Currently Amended): A voltage-driven power semiconductor device,  
comprising:

61 a chip-like injection enhanced gate transistor (IEGT) having a collector on one side,  
and further having a main emitter, a current sense emitter, a current sense terminal connected  
to the current sense emitter, a high-resistance base layer, and a MOS gate on an opposing  
side which opposes said one side, said MOS gate being arranged on a channel region between  
said collector and said main emitter with a gate insulating film interposed between said  
channel region and said MOS gate, a potential of said MOS gate being controlled according  
to an electric current passing through said current sense ~~terminal~~ emitter, electrical current  
from said collector being made to flow to both said main emitter and said current sense  
terminal, a carrier concentration in a current path defined between the main emitter and the  
collector having a maximum value at the opposing MOS gate side of the high-resistance base  
layer, and electron injection efficiency at said main emitter and said current sense ~~terminal~~  
emitter being 0.73 or more, the electron injection efficiency being defined by a ratio of an  
electron current and a total current consisting of the electron current and a hole current;

a plate-like collector electrode terminal arranged on said one side of said IEGT and  
electrically connected to said collector; and

a plate-like emitter electrode terminal arranged on said opposing side of said IEGT  
and electrically connected to said main emitter,

wherein said voltage-driven power semiconductor device is a press-contacting type package,

said collector of said power semiconductor device is pressed by said plate-like collector electrode terminal so that said collector and said collector electrode terminal are electrically connected together, and

said main emitter of said power semiconductor device is pressed by said plate-like emitter electrode terminal so that said main emitter and said emitter electrode terminal are electrically connected together.

26. (Previously Amended): The voltage-driven power semiconductor device according to claim 25, wherein said gate is a trench-type gate embedded in said opposing side of said chip, and

carrier accumulation efficiency of said main emitter and said current sense terminal in an ON state is greater than that of an insulated gate bipolar transistor (IGBT).

27. (Currently Amended): A voltage-driven power semiconductor device, comprising:

a chip-like voltage-driven power semiconductor element having a collector on one side, a main emitter, a current sense emitter, a current sense terminal connected to the current sense emitter, a high-resistance base layer, and a MOS gate on an opposing side which opposes said one side, said MOS gate being arranged on a channel region between said collector and said main emitter with a gate insulating film interposed between said channel region and said MOS gate, a potential of said MOS gate being controlled according to an electric current passing through said current sense ~~terminal~~ emitter, a carrier concentration in

a current path defined between the main emitter and the collector having a maximum value at the opposing MOS gate side of the high-resistance base layer, and electrical current from said collector being made to flow to both said main emitter and said current sense terminal;

a plate-like collector electrode terminal arranged on said one side of said power semiconductor device and electrically connected to said collector; and

a plate-like emitter electrode terminal arranged on said opposing side of said power semiconductor device and electrically connected to said main emitter,

wherein said voltage-driven power semiconductor device is a press-contacting type package,

said collector of said power semiconductor device is pressed by said plate-like collector electrode terminal so that said collector and said collector electrode terminal are electrically connected together, and


said main emitter of said power semiconductor device is pressed by said plate-like emitter electrode terminal so that said main emitter and said emitter electrode terminal are electrically connected together.

28. (Previously Amended) The voltage-driven power semiconductor device according to claim 27, wherein said power semiconductor element is an injection enhanced gate transistor (IEGT),

carrier accumulation efficiency of said main emitter and said current sense terminal in an ON state is greater than that of an insulated gate bipolar transistor (IGBT), and

electron injection efficiency at said main emitter and said current sense terminal is 0.73 or more.

29. (Currently Amended): A voltage-driven power semiconductor device,  
comprising:



a plurality of voltage-driven power semiconductor elements connected in series and in parallel, said power semiconductor elements including semiconductor chips and said semiconductor chips having collectors on one side, ~~and~~ main emitters, at least one current sense emitter, at least one current sense terminal connected to the at least one current sense emitter, high-resistance base layers, and MOS gates on an opposing side which opposes said one side, said MOS gates being arranged on a channel regions between said collectors and said main emitters with gate insulating films interposed between said channel regions and said MOS gates, potential of said MOS gates being controlled according to an electric current passing through said at least one current sense terminal emitter, a carrier concentration in each current path defined between each of the main emitters and each of the collectors having a maximum value at each opposing MOS gate side of the high-resistance base layers, and electrical current from said collectors being made to flow to both said main emitters and said at least one current sense terminal;

a plate-like collector electrode terminal arranged on said one side of said plurality of power semiconductor elements, and electrically connected to said collectors; and

a plate-like emitter electrode terminal arranged on said opposing side of said plurality of power semiconductor elements and electrically connected to said main emitters,

wherein said voltage-driven power semiconductor device is a press-contacting type package,

said collectors of said power semiconductor elements are pressed by said plate-like collector electrode terminal so that said collectors and said collector electrode terminal are electrically connected together, and

said main emitters of said power semiconductor elements are pressed by said plate-like emitter electrode terminal so that said main emitters and said emitter electrode terminal are electrically connected together.

30. (Previously Added): The voltage-driven power semiconductor device according to claim 29, wherein at least those power semiconductor elements connected in series have overvoltage protective circuits.

31. (Currently Amended): A voltage-driven power semiconductor device comprising:

a plurality of voltage-driven power semiconductor elements connected in series and in parallel, said power semiconductor elements including semiconductor chips and said semiconductor chips having collectors on one side, and main emitters, at least one current sense emitter, at least one current sense terminal connected to the at least one current sense emitter, high-resistance base layers, and MOS gates on an opposing side which opposes said one side, said MOS gates being arranged on a channel regions between said collectors and said main emitters with gate insulating films interposed between said channel regions and said MOS gates, potential of said MOS gates being controlled according to an electric current passing through said at least one current sense terminal emitter, a carrier concentration in each current path defined between each of the main emitters and each of the collectors having a maximum value at each opposing MOS gate side of the high-resistance

base layers, electrical current from said collectors being made to flow to both said main emitters and said at least one current sense terminal, and said MOS gates being a trench-type gate embedded in said opposing side;

a plate-like collector electrode terminal arranged on said one side of said plurality of power semiconductor elements, and electrically connected to said collectors; and

a plate-like emitter electrode terminal arranged on said opposing side of said plurality of power semiconductor elements and electrically connected to said main emitters;

wherein said voltage-driven power semiconductor device is a press-contacting type package,

said collectors of said power semiconductor elements are pressed by said plate-like collector electrode terminal so that said collectors and said collector electrode terminal are electrically connected together, and

said main emitters of said power semiconductor elements are pressed by said plate-like emitter electrode terminal so that said main emitters and said emitter electrode terminal are electrically connected together.

32. (Previously Added): The voltage-driven power semiconductor device according to claim 27, wherein said gate is a trench-type gate embedded in said opposing side.